United Republic of Tanzania

LZARDI

Ministry of Agriculture Food Security and Cooperatives

Department of Research and Development

Evaluation of cotton advanced lines on farm for cotton production improvement

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Introduction

- Cotton is important for the national economy
- Contributes
  - 15% of the country's total exports
  - 40% of agricultural exports
- 80% communities in Tanzania depend on agriculture
- Cotton provide employment to more than 40%
- Cotton production fluctuations has been realized

Introduction ctd.

- Effect of climatic changes
  - drought, diseases, insects etc
    - low production with an average of 400-700 kg/ha

- National target - increase production to 2500kg/ha by 2015
  - New technologies to improve production
    - improved varieties as one of the strategy

Introduction

- LZARDI – research on cotton for WCGAs
  - 8 regions for more than 13 M poplation

- LZARDI objective
  - Develop agric. Tech. to contribute to
    - increased agricultural productivity,
    - improved income and food security

  - objectives for cotton research program
    - develop varieties: high yield, resistance to diseases, insect, drought, high GOT, good fibre quality
    - include environmental aspects in pest control programs
    - promote and facilitate the application of ISFM

Sources of Funds

- Funds for research are received from different donors including
- Chemical companies,
- Cotton Development Trust Fund (CDTF)
- The Tanzania Gatsby Trust Fund (TGT)
- and the Government (MTEF).

Stages of variety development

Stages	M. Status	Activities	Result/No of season
1. Introduction exotics	Variety		
2. Crossing	local x exotic	Crossing	F1 progeny **One season**
2. SPS	F1	Evaluate+ select	F1-F6 (6 seasons)
3. PYT	F6	Evaluate: yield, GOT, resistance, fibre	F7 (1 season)
4. SYT	F7	Multilocational:	F8-F10 (3 seasons)
5. Onfarm Trial	F8-F10	Onfarm farmers selection	F11-F13 About 4 lines

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Evaluation of cotton advanced lines Onfarm

Justification
- Farmers preference variety: suitable to cultural practices, high SC, disease & insect tolerance
- Ginners preference variety: high GOT
- Spinner preference: fibre quality

Objective
- To compare the performance of advanced cotton lines with the current commercial variety UKM08

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Materials and methods

- 4 cotton lines NTA93-4/82, NTA90-5/82, NTA93-21/MZL56 and F 135/91 were compared with UKM 08
- Locations - 4 villages in 4 districts
  - Iteja, Bukangilija, Igunda, Kisesa
- RCBD with 4 replications - 4 farmers per site
- Field management and farmers assessment
- Data analysis- Genstat and Clonal selector

Result and discussion

- 2 seasons results indicated the differences
- 2011/12 - NTA93-4/82 (1789kg/ha) and F-135/91 (1642kg/ha) were the best at all sites
- The performance for both were 25% and 14% respectively.
- Lint yields - higher for NTA93-4/82(01)2 (768kg/ha) and F-135/91(01)4 (698kg/ha)
  - Above UKM 08 (628Kg/ha) (22% and 11% respectively)

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Seedcotton yields Kg/ha

No	Entries	2011/2012					2012/2013					2 year mean
		ITEJA	MASWA	IGUNDA	KISESA	UKIRIG	ITEJA	MASWA	IGUNDA	UKIRIG	KISESA	
1	NTA 93-4/82	943	1548	1916	2913	1626	594	1130.5	1174	1222	1099	1417
2	NTA 93-21/MZL	850	854	1663	2956	1357	460	942.2	1212	1082	598	1197
3	NTA 90-5/82	780	1129	1291	2518	1174	510	942.1	1129	990	682	1114
4	F 135/91	677	1456	1709	3007	1365	562	710.7	1314	1083	766	1265
5	UKM 08	717	1294	1181	2589	1366	511	990.7	1175	1408	559	1179
	Trial Mean	793	1256	1552	2797	1378	527	943	1201	1157	741	1235
	CV	23.7	28.6	38.4	11.4	33.7	24.2	57.0	35	13.7	35	
	LSD 5%	290	553	618	490	415	89	379	293	108	183	

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Result and discussion

- 2012/13, NTA93-4/82(01)2 (1043.9kg/ha performed better on sc yields above UKM 08 (929Kg/ha) by 12%.
- Site comparison on sc yield
  - Igunda high yields F-135/91 (1314kg/ha), NTA93-21/MZL561 (1212 kg/ha).
  - Iteja had low yields compared to other sites
  - Bukangilija - NTA93-4/82(01)2 (1131 kg/ha) had the significant higher yields compared to others

Lint yields Kg/ha

| No	Entries	2011/12					2012/13					Mean
		ITEJA	MASWA	IGUNDA	KISESA	UKIRIG	ITEJA	MASWA	IGUNDA	KISESA	UKIRIG	
1	NTA 93-4/82	391	638	833	1270	707	247	491	494	576	481	613
2	NTA 93-21/MZL56	377	365	717	1253	593	202	404	533	492	258	519.
3	NTA 90-5/82	360	454	580	1128	506	216	407	492	444	306	489
4	F 135/91(01)4	302	649	649	1305	586	247	312	594	488	331	546
5	UKM 08	302	572	522	1152	593	223	446	530	659	255	525
	Trial Mean	346	536	660	1222	597	227	412	529	532	326	**539**

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Results and discussion

- – Ukiriguru - range 1100kg/ha to 559kg/ha for NTA93-4/82(01)2 and UKM 08 respectively

- – Kisesa all treatments performed below the controls UKM 08 (1408kg/ha).

- Overall performance for SC - NTA93-4/82 (1470 kg/ha) and F-135/91 (1265kg/ha) were the best above UKM 08
- Ginning percentage was above 40%

Summary of main characters

No	Entries	SC Kg/ha	%UKM 08	Lint Kg/ha	% UKM 08	Gin %	Bmass (gm)	S mass (gm)	FG	CD	BB susceptibility
1	NTA 93-4/82(01)3	1417	120	613	117	43.9	4.67	8.85	6	0	--+
2	NTA 93-21/MZL 56(04)2-3	1197	102	519	99	42.7	4.4	9.04	6	0	+++
3	NTA 90-5/82(01)4	1114	94	489	93	44.0	4.51	8.95	6	0	---
4	F 135/91(01)4	1265	107	546	104	44.4	4.76	9.14	6	1	---
5	UKM 08	1179	100	525	100	44.9	4.91	9.6	6	0	+++
	Trial mean	1234	104.6	539	102	44.0	4.65	9.12	6	0	

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Disease scores

- NTA 93-21/MZL 561 (1.79), F 135/91(01)4 (1.91) were more tolerant to FW disease VS UKM 08 (2.43)

- F135/91 & NTA 90-5/82 more tolerant to BB disease across the sites.
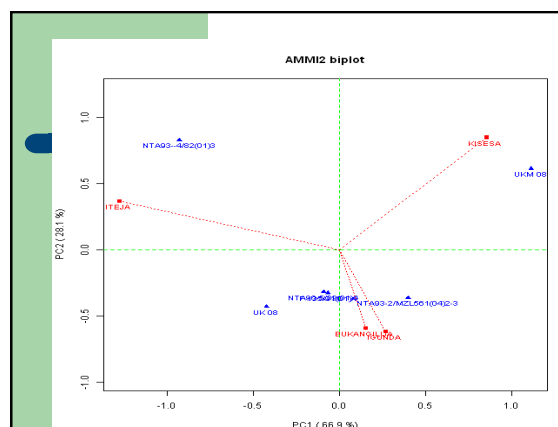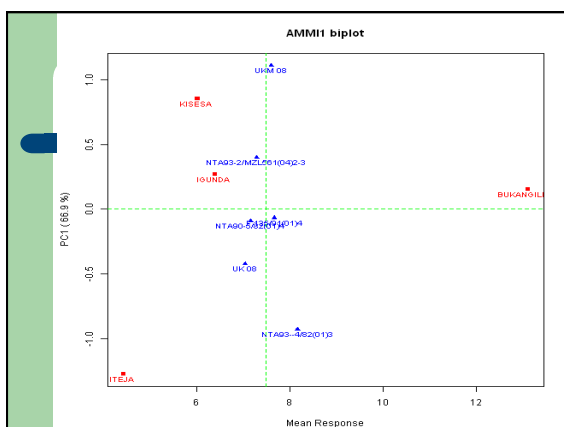
Results and discussion

- The stability level was observed to treatments indicated that treatments NTA90-5/82 and F-135/91(01)4 were more stable compared to others

Farmers Assessment
- Criteria used were:
  - Number of bolls, size of bolls, tolerance to insects and diseases, boll opening, drought tolerance

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Summary of farmers assessment results

Site	Varieties rank				
	NTA93-4/82(01)2	NTA93-21/MZL561(04)2	NTA90-5/82(01)1,	F-135/91(01)4,	UKM 08
Iteja	3	3	1	5	2
Igunda	2	3	5	1	4
Bukangilija	2	3	5	1	4
Kisesa	1	3	5	2	4
Mean	2	3	4	3	4
Rank	2	4	5	1	3

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Summary of Fibre quality

Cotton lines	Length (Inch)	Strength (gram/tex)	Micronaire (Microgram)	Maturity (%)
NTA93-4/82(01)2	1.158	30.1	4.90	0.84
NTA93-21/MZL561(04)2	1.239	27.9	4.82	0.86
NTA90-5/82(01)1,	1.110	29.3	4.39	0.85
F-135 /91(01)4,	1.291	30.0	4.72	0.85
UKM 08	1.122	31.3	4.69	0.86

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Assessment, future plans

- Farmers' assessment : F-135/91(01)4 and NTA93-4/82(01)2 were the best.

- **Future plan:**
  - Compile the third season data for final report

- **Acknowledgment**
  - Financial support from CDTF, TGT, GoT
  - ZDRD, for tech support
  - SEACF organizing committee for supporting the trip

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Thanks for listening